Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages:02

Total No. of Questions: 09

B. Tech. (AE) (Sem.-3rd)

INTERNAL COMBUSTION ENGINES

Subject Code: BTAE-303/401

Paper ID: [A3270]

Time: 3 Hrs. Max. Marks: 60

INSTRUCTIONS TO CANDIDATE:

1. **Section –A, is Compulsory.**

2. **Attempt any four questions from Section-B.**

3. **Attempt any two questions from Section-C.**

4. **Assume any missing data suitably steam table is allowed.**

Section –A (10x2=20)

Q.1.

(a) Define the indicated efficiency.

(b) Write any two merits of four stroke engine.

(c) What is Quantity Governing?

(d) Define specific fuel consumption.

(e) What is supercharging?

(f) Why do we feel the necessity of cooling an I.C engine?

(g) What is the function of fuel filter?

(h) What is meant by cetane number?

(i) What are causes of knock in C.I engines?

(j) What is meant by ignition delay?

Section –B (4X5=20)

Q.2. Explain the phenomenon of knocking in S.I. engine. What are the different factors which influence the knocking?

Q.3. Derive air standard cycle efficiency of the Otto cycle, along with P-V & T-S plots.

Q.4. State the function of a carburetor with a neat sketch and also state its limitations.

Q.5. Explain with suitable sketches the working of a four stroke C.I engine.

Q.6. In an engine working on dual cycle, the temperature and pressure at the beginning of the cycle are 90^0C and 1 bar respectively. The compressions ratio is 9. The maximum pressure is limited to 68 bar and total heat supplied per kg of air is 1750kJ. Determine :

(i) Pressure and temperatures at all salient points

(ii) Air standard efficiency

(iii) Mean effective pressure

Section-C   (10X2=20)

Q.7. A four- cylinder four-stroke, spark-ignition engine develops a maximum brake torque of 160 Nm at 3000 r.p.m. Calculate the engine displacement, bore and stroke. The brake mean effective pressure at the maximum, engine torque point is 960 kPa. Assume bore is equal to stroke.

Q.8. Discuss the difference between theoretical and actual valve timing diagrams of a diesel engine.

Q.9. Discuss with the help of suitable sketches the following:

(a) Wet pump lubrication

(b) Dry pump lubrication

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